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## CLAIMS:

1. An apparatus for detecting an IP (Internet Protocol) address of a device connected to a network, comprising:

5 a search IP address detector for detecting at least one search IP address from IP addresses which are selected every a predetermined number of IP addresses as a unit from possible IP addresses on the network;

an IP address detector for detecting an IP address of a target device from the at least one search  
10 IP address detected; and

a controller for terminating a network information detection operation either when all possible IP addresses on the network have been selected or when the IP address of the target device has been  
15 detected.

2. The apparatus according to claim 1, wherein the IP address detector includes at least one of:

a DNS server detector for detecting an IP address of a DNS (Domain Name System) server; and  
20 a router detector for detecting an IP address of a router.

3. The apparatus according to claim 2, wherein the IP address detector further includes a service

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detector for detecting an IP address of a device providing a service other than services of the DNS server and the router.

4. An apparatus for detecting an IP (Internet Protocol) address on a network including at least a DNS (Domain Name System) server, comprising:

a search IP address detector for detecting at least one search IP address from possible IP addresses on the network;

10 a DNS message communication section for sending a DNS query message to the at least one search IP address and receiving a response message to the DNS query message; and

15 a DNS server detector for discriminating a DNS response message from the response message to detect an IP address of a DNS server originating the DNS response message.

5. The apparatus according to claim 4, wherein the search IP address detector sends an ARP (Address Resolution Protocol) request at a time to IP addresses which are selected every a predetermined number of IP addresses as a unit from the possible IP addresses on the network, and detects the at least one search IP address from an ARP response to the ARP request.

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6. The apparatus according to claim 4, wherein the DNS query message is a message with resetting QR bit of DNS protocol header, which is a message of at least one type selected from a group of standard query, inverse query, server status request and update.

7. The apparatus according to claim 4, further comprising:

an ICMP message communication section for sending an ICMP echo query message to the at least one search IP address and receiving an ICMP response message to the ICMP echo query message; and

a router detector for detecting an IP address of a router originating the ICMP response message.

8. The apparatus according to claim 5, further comprising:

an ICMP message communication section for sending an ICMP echo query message to the at least one search IP address and receiving an ICMP response message to the ICMP echo query message; and

a router detector for detecting an IP address of a router originating the ICMP response message.

9. The apparatus according to claim 7, wherein the ICMP response message is one of an ICMP redirect request message and an ICMP time exceed message.

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10. The apparatus according to claim 8, wherein the ICMP response message is one of an ICMP redirect request message and an ICMP time exceed message.

11. A method for detecting an IP (Internet  
5 Protocol) address of a device connected to a network, comprising:

selecting IP addresses in unit of a  
predetermined number of IP addresses from possible IP  
addresses on the network;

10 detecting at least one search IP address from  
a selected set of IP addresses;

detecting an IP address of a target device  
from the at least one search IP address detected; and

terminating a network information detection  
15 operation either when all possible IP addresses on the  
network have been selected or when the IP address of the  
target device has been detected.

12. A method for detecting an IP (Internet  
Protocol) address on a network including at least a DNS  
20 (Domain Name System) server, comprising:

detecting at least one search IP address from  
possible IP addresses on the network;

sending a DNS query message to the at least  
one search IP address;

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receiving a response message to the DNS query message; and

discriminating a DNS response message from the response message to detect an IP address of a DNS  
5 server originating the DNS response message.

13. The method according to claim 12, wherein the step of detecting the at least one search IP address comprises:

10 sending an ARP (Address Resolution Protocol) request at a time to IP addresses which are selected every a predetermined number of IP addresses as a unit from the possible IP addresses on the network; and

detecting the at least one search IP address from an ARP response to the ARP request.

15 14. A program instructing a computer to a network information detection operation for detecting an IP (Internet Protocol) address of a device connected to a network, comprising the steps of:

20 selecting IP addresses in unit of a predetermined number of IP addresses from possible IP addresses on the network;

detecting at least one search IP address from a selected set of IP addresses;

25 detecting an IP address of a target device from the at least one search IP address detected; and

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terminating a network information detection operation either when all possible IP addresses on the network have been selected or when the IP address of the target device has been detected.

5           15. A program instructing a computer to a network information detection operation for detecting an IP (Internet Protocol) address on a network including at least a DNS (Domain Name System) server, comprising the steps of:

10                 detecting at least one search IP address from possible IP addresses on the network;

                  sending a DNS query message to the at least one search IP address;

                  receiving a response message to the DNS query  
15 message; and

                  discriminating a DNS response message from the response message to detect an IP address of a DNS server originating the DNS response message.

                  16. The program according to claim 15, wherein the  
20 step of detecting the at least one search IP address comprises:

                  sending an ARP (Address Resolution Protocol) request at a time to IP addresses which are selected every a predetermined number of IP addresses as a unit from  
25 the possible IP addresses on the network; and

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detecting the at least one search IP address  
from an ARP response to the ARP request.